ABSTRACT OF THE DISCLOSURE

A plasma processing apparatus includes a vacuum processing chamber having a pair of opposing electrodes for plasma generation, one electrode serving as a sample table for a sample including an insulator film. An electrostatic adsorption film is arranged at the sample table electrode to supply a thermal conductive gas between the film and the sample rear surface. A pressure reducing element is also provided. In addition, arrangements are provided to set a gas pressure within said vacuum processing chamber to 0.5 to 4.0 Pa and to apply a high frequency power of 30 MHz to 200 MHz between the electrodes. An electrode cover is disposed at the other electrode, and a clearance between the electrodes is 30 mm to 100 mm. The electrode cover includes fine apertures to introduce a fluorine-containing etching gas, and a power supply accelerates ions in the plasma